

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 14 March 2001 (14.03.01)	
International application No. PCT/JP00/03942	Applicant's or agent's file reference 661926
International filing date (day/month/year) 16 June 2000 (16.06.00)	Priority date (day/month/year) 08 July 1999 (08.07.99)
Applicant KATO, Seishi et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

22 January 2001 (22.01.01)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Henrik Nyberg Telephone No.: (41-22) 338.83.38
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(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 January 2001 (18.01.2001)

PCT

(10) International Publication Number
WO 01/04297 A3

- (51) International Patent Classification⁷: C12N 15/12, C07K 14/705, 14/47, 16/18, 16/28
- (21) International Application Number: PCT/JP00/03942
- (22) International Filing Date: 16 June 2000 (16.06.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
11/194359 8 July 1999 (08.07.1999) JP
- (71) Applicants (for all designated States except US):
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229-0012 (JP). PROTEGENE INC. [JP/JP]; 2-20-3,
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- (72) Inventors; and
- (75) Inventors/Applicants (for US only): KATO, Seishi
[JP/JP]; 3-46-50, Wakamatsu, Sagamihara-shi, Kanagawa
229-0014 (JP). KIMURA, Tomoko [JP/JP]; 715, 2-9-1,
Kohoku, Tsuchiura-shi, Ibaraki 300-0032 (JP).
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (88) Date of publication of the international search report:
19 July 2001
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 01/04297 A3

(54) Title: HUMAN PROTEINS HAVING HYDROPHOBIC DOMAINS AND DNAS ENCODING THESE PROTEINS

(57) Abstract: The present invention provides human proteins having hydrophobic domains, DNAs encoding these proteins, expression vectors for these DNAs, transformed eukaryotic cells expressing these DNAs and antibodies directed to these proteins.

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 661926	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/JP 00/ 03942	International filing date (day/month/year) 16/06/2000	(Earliest) Priority Date (day/month/year) 08/07/1999
Applicant SAGAMI CHEMICAL RESEARCH CENTER		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☒ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/JP 00/03942

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/12 C07K14/705 C07K14/47 C07K16/18 C07K16/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal, STRAND

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL [Online] EBI; ACC.NO.: AA494446, 28 June 1997 (1997-06-28) STRAUSBERG ET AL.: "National cancer institute, cancer genome anatomy project" XP002151135 abstract	1-7
X	--- WO 98 21328 A (KATO SEISHI ;PROTEGENE INC (JP); SEKINE SHINGO (JP); SAGAMI CHEM R) 22 May 1998 (1998-05-22) page 13 -page 18, paragraph 1; claims 1-5; figures 1,2 --- -/--	1-7

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

26 October 2000

Date of mailing of the international search report

01.02.01

Name and mailing address of the ISA

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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl
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Authorized officer

van Klompenburg, W

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/JP 00/03942

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	D'ANDREA ET AL: "Molecular Cloning of NKBI. A Natural Killer Cell Receptor for HLA-B Allotypes" JOURNAL OF IMMUNOLOGY,US,THE WILLIAMS AND WILKINS CO. BALTIMORE, vol. 155, no. 5, 1 September 1995 (1995-09-01), pages 2306-2310, XP002111500 ISSN: 0022-1767 abstract page 2308, column 1 page 2307, column 2, line 16 ---	1-7
A	GILLEN C M ET AL: "Molecular cloning and functional expression of the K-CI cotransporter from rabbit, rat, and human" JOURNAL OF BIOLOGICAL CHEMISTRY,US,AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, BALTIMORE, MD, vol. 271, no. 27, 5 July 1996 (1996-07-05), pages 16237-16244, XP002119528 ISSN: 0021-9258 abstract; figures 3,4 ---	1-7
A	KYTE J ET AL: "A SIMPLE METHOD FOR DISPLAYING THE HYDROPATHIC CHARACTER OF A PROTEIN" JOURNAL OF MOLECULAR BIOLOGY,GB,LONDON, vol. 157, no. 1, 5 May 1982 (1982-05-05), pages 105-132, XP000609503 ISSN: 0022-2836 page 129 -page 130; figures 1-8; tables 1-6 ---	1-7
A	PESSINO ET AL.: "Molecular cloning of NKp46 a novel member of the immunoglobulin superfamily involved in triggering of natural cytotoxicity" JOURNAL OF EXPERIMENTAL MEDICINE, vol. 188, 1998, pages 953-960, XP000953037 abstract; figure 2B ---	1-7
P,X	DATABASE EMBL [Online] EBI; ACC.NO.: AB035073, 14 January 2000 (2000-01-14) MIURA ET AL.: "Homo sapiens mRNA for platelet glycoprotein VI, complete cds." XP002151136 abstract -----	2

INTERNATIONAL SEARCH REPORT

national application No.
PCT/JP 00/03942

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims: it is covered by claims Nos.:

1-7 all partially

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-7 all partially

A protein comprising amino acid sequence according to SEQ ID NO 1, a DNA sequence of SEQ ID NO 11 or 21, encoding this protein, as well as an expression vector capable of expressing this sequence and a eukaryotic cell expressing the DNA, as well as an antibody direct against the above mentioned protein.

2. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:2,12,22

3. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:3,13,23

4. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:4,14,24

5. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:5,15,25

6. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:6,16,26

7. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:7,17,27

8. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:8,18,28

9. Claims: 1-7 all partially

Identical to invention 1, but limited to SEQ ID NO:9,19,29

10. Claims: 1-7 all partially

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Identical to invention 1, but limited to SEQ ID NO:10,20,30

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PC/JP 00/03942

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9821328 A	22-05-1998	AU 4885297 A EP 0941320 A	03-06-1998 15-09-1999

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

by fax and post

PCT

To:

AOYAMA, Tamotsu
Aoyama & Partners
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1-chome, Chuo-ku, Osaka-shi
Osaka 540-0001
JAPON



Fax: 0081-6-6949-0361

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 05.10.2001

Applicant's or agent's file reference
661926

IMPORTANT NOTIFICATION

International application No.
PCT/JP00/03942

International filing date (day/month/year)
16/06/2000

Priority date (day/month/year)
08/07/1999

Applicant
SAGAMI CHEMICAL RESEARCH CENTER

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA:

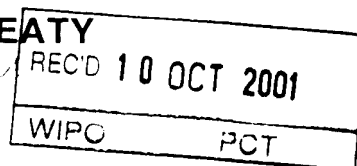
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 661926	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP00/03942	International filing date (day/month/year) 16/06/2000	Priority date (day/month/year) 08/07/1999
International Patent Classification (IPC) or national classification and IPC C12N15/12		
Applicant SAGAMI CHEMICAL RESEARCH CENTER		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 22/01/2001	Date of completion of this report 05.10.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Halle, F Telephone No. +49 89 2399 8537 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/JP00/03942

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-74 as originally filed

Claims, No.:

1-7 as originally filed

Drawings, sheets:

1/10-10/10 as originally filed

Sequence listing part of the description, pages:

1/64-64/64, as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.
- ☒ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/JP00/03942

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:
see separate sheet

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 1-7(all partially).

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 1-7(all partially).

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

- ☐ the written form has not been furnished or does not comply with the standard.
- ☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/JP00/03942

1. Statement

Novelty (N)	Yes:	Claims	1-7(all partially)
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-7(all partially)
Industrial applicability (IA)	Yes:	Claims	1-7(all partially)
	No:	Claims	

2. Citations and explanations **see separate sheet**

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/JP00/03942

Point I.6 The application contains 1-64 sequence listing sheets.

Point III See the items 3.1 and 3.2, below.

Point V

1. The application contains a sequence listing of sheets 1/64-64/64.

2. In this report it is referred to the following documents:

D1: Database EMBL, Accession No. (AC): AA 49 44 46, 28 June 1997

D2: WO 98 21328

- 3.1 The examination is based on the subject-matter of claims 1-7, all partially, according to the first invention mentioned in the International Search Report and for which a search has been carried out; the subject-matter of said invention comprises a protein having an amino acid sequence according to SEQ ID NO. 1, a DNA sequence according to SEQ ID NO. 11 or NO. 21, encoding this protein, as well as an expression vector capable of expressing this sequence and an eucaryotic cell expressing the DNA, as well as an antibody directed against said protein.
- 3.2 The remaining subject-matter claimed which has not been searched will not be the subject of an international preliminary examination (cf. Rule 66.1(e) PCT).
4. The subject-matter of claims 1-7, all partially, as defined in said invention (item 3.1 above), may be considered as novel, since the sequences (SEQ ID NO: 1, 11 and 21) whereupon said subject-matter is based are not disclosed in the prior art.

However, having regard to the documents D1 or D2, it appears that said subject-matter does not involve an inventive step. The corresponding genomic DNA (SEQ ID NO. 21) of the presently claimed protein has 99% identity in an overlap of 471 nucleotides with the EST sequence as disclosed in the prior art D1. Taking into account said EST sequence and the hydrophobicity/hydrophilicity profiles of the proteins encoded by the different clones as disclosed in the second prior art

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/JP00/03942

document D2, it appears that the skilled person would be able to choose a protein with hydrophobic domains as presently claimed without the need of any inventive skill.

5. The above comments are based on the assumption that all claims enjoy priority rights from the filing date of the priority document. In that case the document cited as P,X-document in the international search report is not considered as prior art.
6. The prior art documents cited above should be mentioned in the description, cf. Rule 5.1(a)(ii) PCT.